

APAZIDI, L.Kh., nauchnyy sotrudnik

Etiology of hemorrhagic septicemia in carp. Veterinariia 37  
no.7:40-41 JI '60. (MIRA 16:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut prudovogo  
rybnogo khozyaystva.  
(Hemorrhagic septicemia) (Carp—Diseases and pests)

ALTUKHOV, Yu.P.; APEKIN, V.S.

Serologic analysis of the relationship between the "large" and "small" horse mackerels of the Black Sea. Vop.ikht. 3 no.1:39-50 '63. (MIRA 16:2)

1. Azovo-Chernomoskiy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii (AzCherNIRO), Kerch'. (Black Sea--Saurel)

APPEKIN, V.S.

Comparison of the antigen properties of some tissues of the garfish (*Belone belone euhini* Gün). *Biul. eksp. biol. i med.* 57 no.1:77-81 Ja '64.  
(MIRA 17:10)

1. laboratoriya fiziologii (zav. - kand. biolog. nauk G.Me. Shul'man) Azovo-Chernomorskogo nauchno-issledovatel'skogo instituta rybnogo khozyaystva i okeanografii (dir. - kand. tekhn. nauk A.S. Revin). Predstavlena deystvitel'nym chlenom AMN SSSR N.N. Zhukovym-Verezhnikovym.

APEKIN, V.S.

Changes in the antigenic properties of the ova of *Belone belone*  
*suxini* Gun. in the process of embryonal development. *Biul. eksp.*  
*biol. i med.* 57 no.3:115-119 Mr '64.

(MIRA 17:11)  
1. Laboratoriya fiziologii (zav. - kand. biol. nauk G.Ye. Shul'-  
man) Azovo-Chernomorskogo nauchno-issledovatel'skogo instituta  
rybnogo khozyaystva i okeanografii (dir. - kand. tekhn. nauk A.S.  
Revin), Kerch'. Predstavlena deystvitel'nyim chlenom AMN SSSR  
N.N. Zhukovym-Verezhnikovym.

APEKIN, V.S.

Study of the antigenic composition of sturgeon oocytes and its changes in the process of maturation. Dokl. AN SSSR 165 no.4:966-969 D '65. (MIRA 18:12)

1. Azovsko-Chernomorskiy nauchno-issledovatel'skiy Institut morskogo rybnogo khozyaystva i okeanografii, Kerch'.  
Submitted January 18, 1965.

USSR / Solid State Physics / Phase Transformations : n Solid  
Bodies

E-6

Abs Jour : Ref Zhur - Fizika, No. 5, 1957 No. 11702

Author : Apektor, A. G.

Inst

Title : Determination of the Orientation of the Surface Elements of  
the Microstructure.

Orig Pub : Zavod. laboratoriya, 1955, 21, No. 8, 955 - 960

Abstract : No abstract.

Card: 1/1

Apel, L.S.

Chemical Abst.

Technique of determination of carbon dioxide and  
oxide in air. S. Apel and Ya. ~~...~~

APEL', Ya.A.; APEL', L.S.

Case of micromercurialism long after work with exposed mercury  
had ceased. Gig.i san. no.5:51 My '54. (MLRA 7:5)

1. Iz promyshlenno-sanitarnoy laboratorii Chitinskoy oblastnoy  
sanitarno-epidemiologicheskoy stantsii. (Mercury--Toxicology)

APEL', Ya.A.; APEL', L.S.

Simplified method for preparing a barite solution. Lab. delo [7]  
no.4:29-30 Ap '61. (MIRA 14:3)

1. Chitinskiy nauchno-issledovatel'skiy institut epidemiologii,  
mikrobiologii i gigiyeny (dir. B.V.Novokreshchenov) i Shitinskaya  
oblastnaya sanitarno-epidemiologicheskaya stantsiya (glavnyy vrach  
I.I.Rayngol'd).

(BARIUM OXIDE)

KEIL, Gerhard, dipl. chem.; MENZEL, N.; APEL, W.

Oxidation resistance of lubricating oils. Ropa a uhlie 6 no.8:  
232-236 Ag. '64.

1. Research Worksite. Mineralolwerk National Enterprise, Lutzkendorf,  
German Democratic Republic.

1751, 10. 11.

Chemical Abat

Technical Report of the Department of Defense

APEL', Ya.A.; APEL', L.S.

Case of micromercurialism long after work with exposed mercury  
had ceased. Gig.i san. no.5151 My '54. (MLRA 7:5)

1. Iz promyshlenno-sanitarnoy laboratorii Ghitinsky oblasti  
sanitarno-epidemiologicheskoy stantsii. (Mercury--Toxicology)

APEL', Ya.A.; APEL', L.S.

Simplified method for preparing a barite solution. Lab. delo [7]  
no.4:29-30 Ap '61. (MIRA 14:3)

1. Chitinskiy nauchno-issledovatel'skiy institut epidemiologii,  
mikrobiologii i gigiyeny (dir. B.V.Novokreshchenov) i Shitinskaya  
oblastnaya sanitarno-epidemiologicheskaya stantsiya (glavnyy vrach  
I.I.Rayngol'd).

(BARIUM OXIDE)

APBL', Ya.A.

Conference on mine dust control. Gig. truda i prof. zab.  
4 no.1:57 Ja '60. (MIRA 15:3)  
(MINE DUSTS--CONGRESSES)

APEL', Ya.A., nauchnyy sotrudnik

Method for determining sulfates, chlorides, and tarry substances  
in atmospheric dust. Gig.i san. 26 no.12:78-79 D '61.

(MIRA 15:9)  
1. Iz Chitinskogo nauchno-issledovatel'skogo instituta epide-  
miologii, mikrobiologii i gigiyeny.  
(DUST)

APEL', Ya. A. (Chita)

Materials on the problem of silicosis control in the mines  
of Chita Province. Gig. truda i prof. sab. 7 no.1:18-23 Ja'63  
(MIRA 16:12)

1. Institut epidemiologii, mikrobiologii i gigiyeny, Chita.

KNASTER, M.B.; APEL'BAUM, L.A.

Solubility of hydrogen and oxygen in concentrated potassium  
hydroxide solutions. Zhur. fiz. khim. 38 no.1:223-225 Ja'64.  
(MIRA 17:2)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova.

ACCESSION NR: AP4044390

S/0195/64/005/004/0696/0705

AUTHOR: Bodrov, I. M.; Apel'baum, L. O.; Temkin, M. I.

TITLE: Kinetics of the reaction of methane with water vapor on a nickel surface

SOURCE: Kinetika i kataliz, v. 5, no. 4, 1964, 696-705

TOPIC TAGS: methane, nickel, catalysis, flow circulation method, nickel catalyst, reaction kinetics

ABSTRACT: The kinetics of the reaction of methane with water vapor in a temperature range of 800-900C with a nickel catalyst applied to various porous carriers were investigated. In addition, methane decomposition was investigated in a vacuum quartz reactor and in a reactor containing nickel foil, and the reaction of methane with water vapor was studied in a vacuum reactor. The measurements were carried out by the flow-circulation method. The experimental process is described and the apparatus is illustrated. The dependence of the reaction rate of  $CH_4$  with  $H_2O$  on the partial pressure of methane, on the ratio  $P_{H_2O}/P_{H_2}$  and on the concentration of  $CO$  in the reaction mixture is shown in tables. The temperature dependence of the reaction shows that the activity of nickel at 800C depends on the history of the sample. The activation energy was 31 kcal/mol. at 800-900C. After carrying out the reaction in a gas mixture containing a large amount of water vapor ( $P_{H_2O}/P_{H_2} =$

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ACCESSION NR: AP4044390

190), the activity of the catalyst increases. This is due to the oxidation of Ni to NiO and subsequent reduction to Ni, which leads to loosening of the surface. The changes in activity can also be due to the removal of carbon, formed during the decomposition of chemisorbed CH<sub>2</sub> radicals. This is the cause of the increased activity of Ni at 800C after the reaction has been carried out at 900C. The P<sub>CO<sub>2</sub></sub>/P<sub>CO</sub> ratio in the reaction product is equal to or less than the value corresponding to the equilibrium of the water vapor. The kinetic equation obtained is explained on the basis of the reaction mechanism in which it is assumed that the limiting stage is the decomposition of CH<sub>4</sub> with the formation of chemisorbed CH<sub>2</sub> radicals. "The authors thank N. V. Kul'kova for helping with the measurements." Orig. art. has: 7 formulas, 1 figure, 6 tables and 9 chemical equations.

ASSOCIATION: Fiziko-khimicheskiy Institut Im. L. Ya. Karpova (Institute of Physical Chemistry)

SUBMITTED: 16Dec63

ENCL: 00

SUB CODE: OC

NO REF SOV: 008

OTHER: 007

Card 2/2

PROCEEDINGS AND DISCUSSION

**Oxidation of ammonia on gauzes of platinum and platinum-rhodium** I. A. Apol'shin and M. Temkin (Kazov Inst. Phys. Chem., Moscow). *J. Phys. Chem. (U.S.S.R.)* 22, 179 (1948) (in Russian). — The apparatus consisted of a quartz tube in which a wire gauze were placed next to each other so that the gas could not flow around them. The wire had diam.  $d = 0.009$  cm., and the geometrical surface area  $S$  per sq. cm. was 1.57 sq. cm. The tube near the gauzes could be heated, and the temp. of the first and the last gauze could be detd. with an optical pyrometer. The outgoing gas was oxidized by  $H_2O_2$  and the soln. titrated with  $NaOH$ ; the result yielded  $x = y$ ,  $x$  and  $y$  being the concns. of  $NO$  and  $NH_3$ , resp., in the gas. In some expts.  $x$  and  $y$  were measured separately. The ingoing gas was mostly 10%  $NH_3$ , 80% air, the pressure was atm., and the temp. of the gauzes usually was 1000-1000°. With  $u = 1$ ,  $x - y$  was 30% of the theory or more as long as the linear velocity  $v$  of the ingoing gas was less than 1 km./hr.; at greater  $v$ , it was smaller; the greater was  $v$ . At  $v = 9$  and 20 km./hr.  $x - y$  was neg., i.e. there was more  $NH_3$  than  $NO$  in the reaction product. This contradicts the statement of Balenston (C.I. 31, 3773) that  $NH_3$  is always completely converted. In crossing a at a const.  $v$  raises the yield  $x - y$ ; e.g.  $x - y$  originates from heat transfer. The values 0.45 and 0.50 at  $v = 2.0$  km./hr. was 10% of the theory at  $u = 1$  and reached when  $k_1$  and  $k_2$  are calcd. from the exptl. data (cf. 80% at  $u = 0$  and 80%). The yield increases with the time above;  $k_1 = 0.931$  and  $k_2 = 0.288$  if  $v$  is expressed in times, contrary to Lalson (C.I. 25, 4811). This proves detd. by diffusion is continued by the observed relation that no decoupling of  $NO$  takes place. Addn. of  $O_2$  to between the temp. of the gauzes and  $y$ , by the slight dec. 100%, presumably because the outgoing gas contains other impurities or  $v$ .

reaction products in addn. to  $NO$ . The highest yield achieved by increasing  $v$  slightly decreases when  $v$  increases in the distance of Pt gauze, but is almost independent of  $v$  on Pt-Rh gauze; therefore, Pt-Rh gauze gives at high  $v$  higher yields of  $NO$  than Pt gauze. If the heating of the tube is discontinued and the gauzes are heated by the heat of reaction only, the first gauze encountered by the gas may be 30% hotter than the last gauze. The drop of pressure across the gauze pack was, e.g., 5 mm. Hg at  $u = 0$  and  $v = 5.0$  km./hr. (41 references. II. *Ibid.* 105, 217. It is assumed that the highest value of  $x - y$  obtained by increasing  $v$  represents  $x$  alone and that the relative yields of  $NO$  and the by-products (presumably  $NH_3$ ,  $NO_2$  and  $NH_4NO_3$ ) are independent of  $v$ . Then the concn.  $y$  of  $NH_3$  can be calcd. from the exptl. values of  $x - y$ ; it sufficiently agrees with the few detns. of  $y$  made. If it is assumed that the rate of decrease of  $y$  is detd. solely by diffusion of  $NH_3$  to the wires and the rules of heat transfer are applied to this diffusion, the equation  $\log(x - y) = (k_1 v S / 4u) + \log(x - y)_0$  holds. In it,  $y_0$  is the original concn. of  $NH_3$ ,  $k_1$  and  $k_2$  are constants which can be approx. calcd. from the data on heat transfer. The values 0.45 and 0.50 at  $v = 2.0$  km./hr. was 10% of the theory at  $u = 1$  and reached when  $k_1$  and  $k_2$  are calcd. from the exptl. data (cf. 80% at  $u = 0$  and 80%). The yield increases with the time above;  $k_1 = 0.931$  and  $k_2 = 0.288$  if  $v$  is expressed in times, contrary to Lalson (C.I. 25, 4811). This proves detd. by diffusion is continued by the observed relation that no decoupling of  $NO$  takes place. Addn. of  $O_2$  to between the temp. of the gauzes and  $y$ , by the slight dec. 100%, presumably because the outgoing gas contains other impurities or  $v$ .

J. J. Burkman

ADD. I.I.A. DETAILING LITERATURE CLASSIFICATION

CA  
APEL'BAUM, L.

Oxidation of ammonia on platinum under low pressures.  
L. Apel'baum and M. I. Terkhin (L. Ya. Karpov Phys.-Chem. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.*, 24, 963-6 (1930). -- The reaction was carried out on a Pt wire 0.1 mm. in diam., 10 cm. long, heated to 820°, in a static system under const. supply of NH<sub>3</sub> from solid NH<sub>3</sub> kept at -160°. Analysis for NO in the products was done by its heterogeneous reaction with O<sub>2</sub> on the liquid-air-cooled wall, no homogeneous reaction taking place between NO and O<sub>2</sub> under pressures of the order of 10<sup>-2</sup> mm. Hg; in the pressure range O<sub>2</sub> from 6.5 to 19.4 × 10<sup>-2</sup> mm., NO from 13.0 to 22.8 × 10<sup>-2</sup> mm., 1 mol. O<sub>2</sub> reacts on the av. with 2.7 mole. NO. Excess of either NO or O<sub>2</sub> was ascertained by pressure drop on addn. of either O<sub>2</sub> or NO, resp. In a reaction vol. of 40 cc., with the initial pressures NH<sub>3</sub> = 7.5 × 10<sup>-2</sup>, O<sub>2</sub> = 48.7 × 10<sup>-2</sup> mm. Hg, 15 sec., the yield of NO was 68%; with 7.5 × 10<sup>-2</sup>, 24.0 × 10<sup>-2</sup>, 15 sec., 78%; with 3.0 × 10<sup>-2</sup>, 24.2 × 10<sup>-2</sup>, 15 sec., 70%; 3.4 × 10<sup>-2</sup>, 24.0 × 10<sup>-2</sup>, 20 sec., 78%; 3.1 × 10<sup>-2</sup>, 16.8 × 10<sup>-2</sup>, 30 sec., 88%. Agreement between the initial O<sub>2</sub> pressures calcd. from the observed pressures of NO, N<sub>2</sub>, and O<sub>2</sub>, after the reaction, and the actual initial O<sub>2</sub> pressures, confirms the occurrence

of the over-all reactions  $4 \text{NH}_3 + 5 \text{O}_2 = 4 \text{NO} + 6 \text{H}_2\text{O}$  and  $4 \text{NH}_3 + 3 \text{O}_2 = 2 \text{N}_2 + 6 \text{H}_2\text{O}$ . No NH<sub>4</sub>OH is formed at 820°. In the 1st approximation the rate is proportional to the pressure of NH<sub>3</sub>, and is independent of the pressure of O<sub>2</sub>. Consequently, the oxidation of NH<sub>3</sub> occurs through collisions of NH<sub>3</sub> mole. with a Pt surface practically entirely covered with O<sub>2</sub> mole., with approx. one in 20 collisions effective.

N. Thon

APPELBAUM, L. E. and WEIN, M. I. (Prof.)

"The Chain Characteristics of Heterogeneous Catalytic Reactions."

report presented at Scientific Conference at the Inst. for Physical Chemistry  
imeni L. Ye. Karpov, Acad. Sci. USSR, Nov 1957.

SOV/81-59-16-56444

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 16, p 65 (USSR)

AUTHORS: Temkin, M.I., Apel'baum, L.O.

TITLE: On the Chain Characteristics of Surface Reactions

PERIODICAL: V sb.: Probl. fiz. khimii. Nr 1, Moscow, Goskhimizdat, 1958, pp 4-100

ABSTRACT: Considering the ability of Pd to pass  $H_2$  in the form of atoms (or  $H^+$  ions), the authors developed a method for studying the mechanism of the heterogeneous catalytic reaction with the participation of  $H_2$ . The reaction was carried out in a flow-circulation system on one (reaction) surface of the Pd-membrane (M), onto which at the same time can enter H atoms from the other (supply) side of the M. The dependence of the reaction rate on the quantity of H atoms passing through M is determined. The obtained data admits of determining the length of the chain  $n = (v-v^0)/x(v^0 - \text{reaction rate in the absence of H flow through M, } v - \text{ reaction rate at the speed of H overflow through M, equal to } x)$ , and also the mean consumption of H atoms per one molecule of reaction product  $v'$ . For the hydrogenation of  $C_2H_4$  at  $20^\circ C$ ,  $n = 0.3 - 0.5$  and  $1 < v' < 3$ ; at  $175^\circ C$ ,  $n = 0$  and  $v' < 0.25$ . The values of  $v'$  and  $n$  at  $20^\circ C$  show that the reaction proceeds by means of the consecutive addition of adsorbed H atoms. The values of  $v'$  and  $n$

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On the Chain Characteristics of Surface Reactions

SOV/81-59-16-56444

at 175°C agree with the proposition that the reaction is a chain reaction, i.e., includes the stage  $C_2H_5(ads.) + H_2 = C_2H_4 + H(ads.)$ , in which case the processes of formation and rupture of the chains  $H_2 = 2H(ads.)$  take place more frequently than the processes of chain development. Another possible explanation is, that parallel with the mentioned reaction the process  $C_6H_4(ads.) + H_2 = C_2H_6$  takes place. The mentioned data show that at an increase of the temperature the mechanism of the reaction changes: the  $H_2$  molecules start taking part in it.

L. Apel'baum.

Card 2/2

5(4)

AUTHORS: Belatnikova, Yu. I., Apel'baum, L. O. SOV/76-32-12-10/32  
Tezkin, M. I.

TITLE: The Poisoning of Ammonia Synthesis Catalysts by Hydrogen Sulfide, Traced With Radioactive Sulfur (Izucheniye otravleniyn katalizatora sinteza ammiaka serovodorodom s primeneniym radiosery )

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 12, pp 2717 - 2724 (USSR)

ABSTRACT: The effect of  $H_2S$  on iron catalyts activated by  $Al_2O_3$ ,  $Al_2O_3 + K_2O$  or  $K_2O$  alone was investigated. The effect on the  $Fe + Al_2O_3$  catalyst is most easily explained. The poisoning is irreversible. Failure of the poisoning to ensue when 20% of the surface are covered with sulfur corresponds to the concept of surface effects, according to which the ammonia synthesis results predominantly in places with medium adsorption capacity. Therefore, the synthesis is, at first, not influenced by covering the strongly adsorbing points. Since, however, the weakly adsorbing

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The Poisoning of Ammonia Synthesis Catalysts by Hydrogen Sulfide, Traced With Radioactive Sulfur SOV/76-32-12-10/32

points do not participate in the synthesis reaction either, complete poisoning sets in when 80% of the surface are covered with sulfur. The formation of a monoatomic layer suffices for poisoning. With the  $\text{Fe}+\text{Al}_2\text{O}_3+\text{K}_2\text{O}$  catalyst a temporary poisoning can be observed when less than 20% of the surface are covered with sulfur. Perhaps this can be explained by the uneven distribution of the sulfur due to the reduced mobility of the S-atoms. Generally speaking, this catalyst is not so easily poisoned as the simpler  $\text{Fe}+\text{Al}_2\text{O}_3$  catalyst. Probably  $\text{K}_2\text{O}$  reacts with  $\text{H}_2\text{S}$  which explains the high resistivity against poisoning. In this case potassium is bound as  $\text{KAlO}_2$ , is not volatile, but still binds the hydrogen sulfide. The  $\text{Fe}+\text{K}_2\text{O}$  catalyst easily loses  $\text{K}_2\text{O}$ , or rather the potassium volatilizes and deposits on the wall as  $\text{K}_2\text{S}$ . While  $\text{Al}_2\text{O}_3$  stabilizes the finely dispersed structure of the catalyst,  $\text{K}_2\text{O}$  causes a greater intensity

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The Poisoning of Ammonia Synthesis Catalysts by Hydrogen Sulfide, Traced With Radioactive Sulfur SOV/76-32-12-10/32

towards  $H_2S$ . The formation of the  $FeS$ -film on the surface of the  $Fe+Al_2O_3+K_2O$  catalyst ceases when the layer has reached a thickness of about  $40 \text{ \AA}$ . There are 6 figures, 2 tables, and 20 references, 12 of which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova, Moskva  
(Physico-Chemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: July 31, 1957

Card 3/3



5(4)

AUTHORS:

Apel'baum, L. O., Gel'bshteyn, A. I., SOV/76-33-2-45/45  
Kul'kova, N. V., Morozov, N. M.

TITLE:

Mikhail Isaakovich Temkin (Mikhail Isaakovich Temkin).  
(On His 50th Birthday) (K 50-letiyu so dnya rozhdeniya)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 2, pp 507-508  
(USSR)

ABSTRACT:

Professor M. I. Temkin dedicated more than 25 years of his scientific activity to the theoretical problems of physical chemistry. He first set forth the theory of the kinetic catalytic reactions on heterogeneous surfaces, which is based on the logarithmic adsorption isothermal lines (Temkin isothermal lines). With this theory he and his collaborators were able to define kinetics and the mechanism of such important processes in chemical technology as the ammonia synthesis, the production of water gas, the gasification of coal, and others. For his investigations in the field of the linear relationship between the activation energy and the heat effects of heterogeneous catalytic processes and for his work on the processes of chemisorption Temkin received the premiya im. A. N. Bakha (Prize imeni A. N. Bakh) in 1957. Temkin founded

Card 1/2

Mikhail Isaakovich Temkin. (On His 50th Birthday)

SOV/76-33-2-45/45

the concept of "adsorption of high intensity" and explained the catalytic oxidation of ethanol as an example of it. Temkin was the first to obtain a general, theoretical expression for the absolute rate of reaction on surfaces of solid bodies, which is of fundamental importance in the theory of catalysis. M. I. Temkin also showed that the activation energy of electrochemical processes can be determined theoretically and experimentally, and without difficulty, in relation to the absolute potential. Temkin's ion theory of melted salts and metallurgical slags is well-known in his own country and in foreign countries. His investigations in the field of thermoelectric phenomena in electrolyte solutions and his concept of "ions agitated by entropy" have been confirmed in the papers by English authors. Several papers of M. I. Temkin are concerned with the thermodynamic properties of real gas mixtures. From 1939 to 1949 Temkin was Editor of the Zhurnal fizicheskoy khimii (Periodical of Physical Chemistry). He was awarded the Order of the Red Banner of Work and other Orders of Honor. There is 1 figure.

Card 2/2  
USCOMM-DC-60795



APEL'BAUM, L.O.; BERZINA, Yu.I.; TENKIN, M.I. (Moscow)

Radiochemical study of the sulfur poisoning of a cobalt catalyst employed in the oxidation of ammonia. Zhur. fiz. khim. 34 no.12: 2795-2803 D '60. (MIRA 14:1)

1. Fiziko-khimicheskiy institut imeni K.Ya. Karpova.  
(Sulfur—Isotopes) (Cobalt oxide)

APEL'BAUM, L.O.; TEMKIN, M.I.

Mechanism of the catalytic hydrogenation of ethylene. Zhur.fis.  
khim. 35 no.9:2060-2070 '61. (MIRA 14:10)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova, Moskva.  
(Ethylene) (Hydrogenation)

TEMKIN, M.I.; APPEL'BAUM, L.O.

Chain characteristics of surface reactions. Probl.fiz.khim.  
no.1:94-100 '58. (MIRA 15:11)

1. Laboratoriya khimicheskoy kinetiki Nauchno-issledovatel'skogo  
fiziko-khimicheskogo instituta im. Karpova.  
(Catalysis)  
(Chemical reaction, Rate of)

ABRAMOVICH, Genrikh Neumovich. Prinimali uchastiye: YAKOVLEVSKIY, O.V.;  
AVDIYEVSKIY, Y.S.; SMIRNOVA, I.P.; CHERKIZ, A.Ya. APKL'BAUM.  
S.O., red.; TUMARKINA, N.A., tekhn.red.

[Theory of turbulent jets] Teoriia turbulentnykh strui. Moskva,  
Gos.izd-vo fiziko-matem.lit-ry, 1960. 715 p. (MIRA 13:10)  
(Turbulence) (Jets)

APEL'BAUM, S. Ye., and DERGAUSOVA, Ye. A.

"Protein metabolism in experimental hypothyreosis in rats", paper read at the  
First Ural Conference of Physiologists, Biochemists, and Pharmacologists,  
Sverdlovsk, 5-8 June 1956.

Sum. I305

AFELTAUER, M.

"Economic analysis of the intensive methods of operating poultry farms in Czechoslovakia"

SBORNÍK. RADA ZEMĚDĚLSKÁ EKONOMIKA. Praha, Czechoslovakia, Vol. 32, No. 6, June 1959.

Monthly List of East European Accessions (SEAI), LC, Vol. 8, No. 9, September 1959.

Unclassified.

APELTIN, I. E. [Apel'tsin, I. Ye.]

Treatment of water in fighting corrosion. Analele chimie 16 no.3:  
135-145 J1-S '61.

(Water) (Corrosion and anticorrosives)

RUSAKOV, Viktor Pavlovich; SHILO, N.A., otv. red.; POTEMKIN, S.V., zam. otv. red.; ALEKSANDROV, P.P., red.; AFEL'TSIN, F.R., red.; BEREZIN, V.P., red.; KALABIN, A.I., red.; KUZNETSOV, G.G., red.; MATSUYEV, L.P., red.; NUZHIDIN, I.I., red.; FIRSOV, L.V., red.; FOMENKO, T.G., red.; VANSHEYDT, N.A., red.

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(NIRA 12:4)

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(Or. dressing)

(Screens (Mining))

(MIRA 12:4)

PETROV, Appolinary Stepanovich; SHILO, N.A., otv. red.; ALEKSANDROV, P.P., red.;  
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KOZNETSOV, G.G., red.; MATSUYEV, L.P., red.; NUZHIDIN, I.I., red.;  
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Trudy. Mestnye stroimaterialy, no.7) (MIRA 12:5)  
(Soil cement) (Building blocks)

3(5), 15(6) PHASE I BOOK EXPLOITATION

SOV/1645

Apel'tsin, F. R. and L. G. Fel'dman

Geologiya mestorozhdeniy redkikh elementov. vyp. 2: Kolumbitonosnyye granity  
(Geology of Rare Element Deposits. no. 2: Columbite-Bearing Granites)  
Moscow, Gosgeoltekhizdat, 1958. 48 p. 5,000 copies printed.

Sponsoring Agency: Vsesoyuznyy nauchno-issledovatel'skiy institut mineral'nogo  
syr'ya.

Eds.: A. I. Ginsburg and S. V. Ovchinnikova; Tech. Ed.: T. A. Averkiyeva;  
Editorial Board: A. I. Ginsburg (Chief Ed.), I. I. Malyshev, G. G. Rodinov,  
V. P. Fagutov, N. A. Khrushchov, Yu. L. Chernosvitov, I. V. Shmanenkov,  
V. V. Shcherbina, and M. A. Egeles.

PURPOSE: This booklet is intended for geologists, mining engineers and other  
specialists connected with columbium (niobium) mineral mining.

Card 1/3

Geology of Rare Element Deposits

SOV/1645

COVERAGE: This booklet provides a general, non-technical treatment of columbium materials and, more specifically, of the columbite-bearing granites of Northern Nigeria. Detailed descriptions of the various columbite-bearing minerals and deposits are given and amplified by charts and tables. Physical descriptions of the Northern Nigerian fields are also included. Of especial interest is the authors' contention, in the Introduction, that the US is stockpiling, as strategic commodities, niobium and tantalum minerals. The authors state that the US purchased in the period 1943-1952 some 68 percent of the production of all capitalist countries and continues to purchase over 80 percent of the production of Northern Nigeria. During this period, US native production averaged only one ton per year even though this country possesses significant resources of these minerals, especially in Arkansas. There are 19 references, of which 12 are English, 6 American and 1 Soviet.

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Card 3/3

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L.V., red.; BEUS, A.A., red.; GREKULOVA, L.A., red.;  
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PA 58736

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Jul 1947

USSR/Engineering  
Water Systems  
Water Softeners

"Stabilization of Industrial Water," I. E. Apel'tsin,  
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"Stal'" No 7

Determination of stability of industrial water, characterized by its inability to precipitate or dissolve calcium carbonate, as well as impossibility of making an exact account of the reagents for its stabilization, is very important in plant economy. Stabilization of water prevents formation of active carbonic acid which corrodes metal and concrete, and prevents formation of calcium carbonate deposits on water pipes.

58736

FA 38/49744

APEL'TSIN, I. Ye.

Mar 49

USSR/Engineering  
Water - Purification  
Calcium Carbonate

"Precipitation of Calcium Carbonate on the Nuclei of  
Cations," I. E. Apel'tsin, V. A. Klyachko, Ye. N.  
Teterkin, Candidates Tech Sci, 2 pp

"Elek Stants" No 3

Corrects number of inaccuracies in article by G. Ye.  
Krushel', "Preventing the Precipitation of Carbonates  
on Glauconite Nuclei," particularly in the design of  
the purifying agent and in determining conditions under  
which calcium carbonate is deposited on the cation  
nuclei.

38/49744

CA  
APPELLTAIN, I. J. C.

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Determination of the conditions for precipitating the slightly soluble compounds formed in the softening and deferrization of water. I. E. Appeltain. *J. Applied Chem. U.S.S.R.* 23, 47 (1950) Eng. translation. *Publ. Div. of Chem. 23, 47 (1950)*. Hydrolysis constants were calculated for  $\text{CaCO}_3$ ,  $\text{Mg(OH)}_2$ , and  $\text{Fe(OH)}_3$ . Activity coefficients were applied and pH values obtained for saturated solutions. Z. D. Shklovsk.

APEL'TSIN, I.E.; MAKSIMOVICH, O.K.; SAVINA, Z.A., redaktor; POLOSINA, A.S.,  
tekhnicheskiy redaktor

[Preparation of water for flooding petroleum strata] Podgotovka vody  
dlia savodneniia neftianyykh plastov. Moskva, Gos.nauchno-tekhn.isd-  
vo neftianoi i gorno-toplivnoi lit-ry, 1951. 239 p. (MLRA 9 1)  
(Petroleum engineering)

APEL'TSIN, I. E.

AID - P - 189

Subject : USSR/Engineering  
Card : 1/1  
Author : Apel'tsin, I. E.  
Title : The Effect of the Cracks in the Rock on Water Flooding of the Stratum in the Zones of Pumping Wells (Part I).  
Periodical : Neft. khoz., v. 32, #2, 23-26, F 1954  
Abstract : Difficulties in flooding of the Devonian strata due to presence of cracks are discussed. The theory of filtration with formation of a deposit is analytically formulated with differential equations. (Part II, see next issue #3, p. 15).  
Institutions: Central Scientific Research Laboratory (TsNIL) of the Taymazanefit Trust; All-Union Scientific Research Inst. for Water Supply, Sewer System, Hydraulic Structures and Hydrogeological Engineering (VODGEO)  
Submitted : No date

APEL'TSIN, I.E.

I-11

USSR/Chemical Technology - Chemical Products and Their Application. Water treatment. Sewage water.

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 12762

Author : Apel'tsin I.E., Zolotova Ye.F.  
Title : Use of Sodium Hexametaphosphate in the Technique of Water Treatment

Orig Pub : Sb. Issledovaniya po vodopodgotovke, M., Gos. izd-vo lit. po str-vu i arkhiterture, 1955, 93-115

Abstract : Considered is the use of  $(\text{NaPO}_3)_6(\text{I})$  to control corrosion of steel pipes, prevention of the formation of carbonate deposits and separation of  $\text{Fe}(\text{OH})_3$  from water containing  $\text{Fe}^{2+}$ , and also to remove carbonate and ferruginous deposits. Investigation of corrosion processes in the presence of I (carried out with the use of radio isotope  $\text{Ca}^{45}$ ) has shown that protective action of  $(\text{NaPO}_3)_6$  is due to the formation at the cathodic areas of difficultly soluble complexes of the type of  $\text{Me}[\text{Me}_2(\text{PO}_3)_6]$ , mostly of

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USSR/Chemical Technology - Chemical Products and Their  
Application. Water treatment. Sewage water.

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Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 12762

Ca  $\left[ \text{Ca}_2(\text{PO}_3)_6 \right]$ . Velocity of the water flow affects the protective action which increases rapidly at velocities  $> 0.4-0.5$  m/sec. At low velocities I can not be considered an effective corrosion inhibitor. Dosage of I is recommended to be determined on the basis of the ratio  $C(\text{NaPO}_3)_6 : C_{\text{Ca}^{2+}} 3.5$  Ca using I for the treatment of water of a recirculation cooling system, it is recommended to use as a basis the value of highest (permissible) alkalinity of the circulating water, for the computation of which is given the following empirical formula:  $\text{Alk}_C = 7 - 0.15 (C_{\text{Ca}^{2+}} : 20 - \text{Alk}_A)$ , wherein  $\text{Alk}_C$  is the highest alkalinity of circulating water, in mg-equivalent/liter;  $\text{Alk}_A$  -- alkalinity of added water, in mg-equivalent/liter;  $C_{\text{Ca}^{2+}}$  -- concentration of  $\text{Ca}^{2+}$  in added water, in mg/liter. Investigation of the rate of dissolution of  $\text{Fe}(\text{OH})_3$ , retained by a sand filter, has shown the

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USSR/Chemical Technology - Chemical Products and Their  
Application. Water Treatment. Sewage Water.

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Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 12762

suitability, for the removal of these deposits, of so-  
lutions of I having a concentration of 0.1-0.5%. Direc-  
tions are given for the preparation and proportioning of  
the solutions.

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APPEL'TSIN, I.B.

Preventing corrosion in pipes used in injecting water into oil-bearing strata. Vod. i san. tekhn. 1 no.2:3-7 My'55.

(MLRA 8:11)

(Pipe, Steel--Corrosion) (Oil field flooding)

*А. Р. Петров, Е. К.*

Use of Radioactive Isotopes for Laboratory Investigations of the Corrosion Processes of Steel in Natural Waters. I. E. *Metic*  
А. Р. Петров, Е. К. (Заводская Лаборатория, 1955, 21, (1), 36-37)

*Metic*

[In Russian]. The method of investigating steel corrosion in water described is based on the deposition on the corroded parts of the surface of radioactive cesium, added in small quantities to the water. The corrosion process is followed by the growth of the number of radioactive impulses from the immersed steel surface. The method can be used for comparing the effectiveness of various corrosion inhibitors or the corrosion stability of various steels in the same neutral liquid. Autoradiographs of immersed steel plates show clearly the anodic and cathodic parts of the micro-cells. — E. K.

*100  
+ 2ml*

*1*

*2ml  
1/2*

Name: **APKLTSEN, Isak Emil'yevich**

Dissertation: Preparation of water for the purpose of forcing it  
into petroleum deposits.

Degree: Doc Tech Sci

Affiliation: [Not indicated]

Defense Date, Place: 9 Jun 56, Council of All-Union Sci Res Inst of  
Water Supply, Canalization, Hydraulic Engineering  
Construction, and Engineering Hydrogeology

Certification Date: 6 Apr 57

Source: BMVO 14/57

APEL'TSYN, I.N., doktor tekhn.nauk; BARS, Ye.A., kand.geol.-min.nauk;  
BORISOV, Yu.P., kand.tekhn.nauk; VELIKOVSKIY, A.S., prof.; VYSOTSKIY,  
I.V., kand.geol.min.nauk; GOVOROVA, G.L., dots.; DAKHNOV, V.M., prof.  
ZHDANOV, M.A., prof.; ZHUKOV, A.I., dots.; KOTYAKHOV, P.I., prof.;  
KREMS, A.Ya., doktor geol.-min.nauk; MURAV'YEV, I.M., prof.;  
MUSHIN, A.Z., inzh.; NAMIOT, A.Kh., kand.tekhn.nauk; KHODANOVICH,  
I.Ye., kand.tekhn.nauk; KHLYSTOV, V.T., inzh.; CHERNOV, B.G., kand.  
tekhn.nauk; SHUROV, V.I., dots.; SAVINA, Z.A., vedushchiy red.;  
POLOSINA, A.S., tekhn.red.

[Manual fo petroleum extraction] Spravochnik po dobyche nefi.  
Pod obshchei red. I.M.Murav'eva. Moskva, Gos. snuchno-tekhn.isd-vo  
neft. i gorno-toplivnoi lit-ry. Vol. 1. 1958. 540 p. (MIRA 11:4)  
(Petroleum industry)

APEL'TSIN, I.E.

Determining the amount of alkalies necessary for the formation  
of a protective carbonate coating on the walls of water pipes.  
Isal.p. vodopodg. no.3:25-37 '59. (MIRA 12:9)  
(Water pipes--Corrosion) (Protective coatings)

APEL'TSIN, I.E.; ZOLOTOVA, Ye.F.; PEREMYSLOVA, Ye.S.

Laboratory investigation of methods for the removal of hydrogen sulfide from drainage waters. Issl.po vodopodg. no.3:143-158  
'59. (MIRA 12:9)  
(Water--Purification) (Hydrogen sulfide)

APEL'TSIN, I.N.; ZOLOTOVA, Ye.F.

Use of sparingly soluble metaphosphates in water treatment.  
Vod. i san.tekh. no.4:34-36 Ap '59. (MIRA 12:5)  
(Metaphosphates) (Waterpipes) (Corrosion and anticorrosives)

**APEL'TSIN, I.E., doktor tekhn. nauk**

Use of hexametaphosphates in water purification. *Vod. i san. tekhn.*  
no.12:33-34 D '59. (MIRA 13:3)

**I.Vsesoyuznyy nauchno-issledovatel'skiy institut vodosnabzheniya,  
kanalisatsii, gidrotekhnicheskikh sooruzheniy i inzhenernoy gidrogeologii.  
(Water--Purification) (Sodium metaphosphates)**

APKL'TSIN, Isaak Emil'yevich; SAYINA, Z.A., insh., vedushchiy red.;  
POLOSINA, A.S., tekhn.red.

[Processing water for oil field flooding] Podgotovka vody  
dlia zavodneniia neftiisnykh plastov. Moskva, Gos.nauchno-tekhn.  
isd-vo nefi. i gorno-toplivnoi lit-ry, 1960. 298 p.

(MIRA 14:1)

(Oil field flooding)

PHASE I BOOK EXPLOITATION

SOV/3854

Akol'zin, P. A., P. N. Andreyev, I. E. Apel'tsin, S. M. Gurvich, A. A. Kot, Yu. M. Kostrikin, I. I. Koshelev, A.P. Mamet, Yu. O. Novi, M. M. Sendik, I. Kh. Khaybullin

Spravochnik khimika-energetika. tom 1: Spravochnyye materialy obshchego naznacheniya (Handbook of Chemistry in Power Engineering. Vol 1: General Reference Material) Moscow, Gosenergoizdat, 1960. 327 p. 20,000 copies printed.

Eds.: V.A. Golubtsov, S.M. Gurvich, Yu. M. Kostrikin, and A.P. Mamet; Tech. Ed.: K. P. Voronin.

**PURPOSE:** This handbook is intended for chemists in the field of power engineering, personnel of laboratories, scientific research institutes, and planning and control organizations, as well as for students of universities and tekhnikums.

**COVERAGE:** This is the first of a three-volume handbook of chemistry in power engineering. It includes data on the water system of boilers, causes of corrosion and methods for controlling it. It also contains general reference material on measures and units, chemical compounds, water and solutions, solubility of substances in water and water vapor at various temperatures, electrochemistry, gases, specifications and prices for certain reagents and materials. The book includes tables, charts, and diagrams. No personalities are mentioned. There are 52 references: 39 Soviet, 10 English, 2 German, and 1 Swedish.

Card 1/12

APEL'TSIN, I.E., doktor tekhn.nauk

Treatment of water for preventing corrosion. Zhur. VKHD 5 no.6:645-650  
'60. (MIRA 13:12)

(Water pipes—Corrosion)

SHKROB, Mikhail Samoylovich, doktor tekhn. nauk; PROKHOROV, Fedor Georgiyevich, kand. tekhn. nauk. Prinsipali uchastiye: AKCL'ZIN, P.A., doktor tekhn. nauk; AFEL'TSIN, I.E., doktor tekhn. nauk; ZENKEVICH, Yu.V., kand. tekhn. nauk; KVIATKOVSKIY, V.M., kand. tekhn. nauk; KLYACHKO, V.A., doktor tekhn. nauk; GURVICH, S.M., inzh.; ORZHEROVSKIY, M.A., inzh.; STYRIKOVICH, M.A., retsenzent; MARTYNOVA, O.I., retsenzent; VORONIN, K.P., tekhn. red.

[Water treatment and water systems for steam-turbine electric power plants] Vodopodgotovka i vodnyi rezhim paroturbinnykh elektrostantsii. Moskva, Gos. energ. izd-vo, 1961. 470 p. (MIRA 14:9)  
(Feed water purification) (Steam turbines)

KLYACHKO, V.A.; APEL'TSIN, I.E.; Primalni uchastiye: PAVLOV, G.D.;  
MIRKIS, I.M.; TÜRCHINOVICH, V.T., prof., retsenzent;  
KASTAL'SKIY, A.A., prof., doktor tekhn. nauk, nauchnyy red.;  
SMIRNOVA, A.P., red.izd-va; GOL'BERG, T.M., tekhn. red.

[Preparation of water for industrial and municipal water supply] Podgotovka vody dlia promyshlennogo i gorodskogo vodosnabsheniia. Moskva, Gos.izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1962. 818 p. (MIRA 16:3)  
(Water--Purification)

ApEn, A.A.

27

11

78

ANDRZHEYEVSKIY, A.N., inzh.; AMARYAN, L.S., kand. tekhn. nauk;  
APENCHENKO, L.S., inzh.; BULYNKO, M.G., kand. tekhn. nauk

Experiment in the manufacture of peat litter in the form of  
slabs. Torf. prom. 39 no.7:27-28 '62. (MIRA 16:8)

1. Gusevskoye torfopredpriyatiye Vladimirovskogo soveta narodnogo  
khozyaystva (for Andrsheyevskiy). 2. Kalininskiy torfyanoy  
institut (for Amaryan, Apenchenko, Bulynko).  
(Peat industry—Equipment and supplies)

APENCHENKO, S. S.

PA 47/49T37

USSR/Engineering  
Mining Machinery  
Peat Production

Jan 49

"Performance of Drain-Building and Disking  
Equipment Used at the Gusev Peat Enterprise,"  
S. S. Apenchenko, K. K. Bagon, Engineers,  
1 3/4 pp

"Torf Prom" No 1

In 1948 six of subject machines were used at  
subject enterprise. One was built in 1946  
by "Ivtorfmas" plant and five in 1947-1948  
by Kuznetsk plant. Describes numerous defects  
and difficulties encountered.

47/49T37

ALEKSHYEV, Ye.T.; APENCHENKO, S.S.; BASOV, A.P.; BAUSIN, A.F.; BERSHADSKIY, L.S.;  
VELLER, M.A.; GINZBURG L.N.; GUSEV, S.A.; DANILOV, O.V.; DOLOIKH, M.S.;  
DRUZHININ, N.N.; YEFIMOV, V.S.; ZAVADSKIY, N.V.; IVASHECHKIN, N.V.;  
KARAKIN, F.F.; KUZHMAN, G.I.; LOBANOV, S.P.; MERKULOV, Ya.V.; NIKODIMOV,  
P.I.; PANKRATOV, N.S.; PYATAKOV, L.V.; RODICHEV, A.F.; SMIRNOV, M.S.;  
STRUKOV, B.I.; SAVOCHKIN, S.M.; SAMSONOV, N.N.; SINITSYN, N.A.; SKOLOV,  
A.A.; SOLOPOV, S.G.; CHELYSHEV, S.G.; SHCHEPKIN, A.Ye.

Fedor Nikolaevich Krylov; obituary. Torf. prom. 35 no.6:32 '58.  
(MIRA 11:10)  
(Krylov, Fedor Nikolaevich, 1903-1958)

APZINCHENKO, S.S., inzh.

Seven-year plan for the development of the peat industry of  
the Kalinin Economic Council. Torf.prom. 36 no.3:4-6 '59.  
(MIRA 12:7)

1. Kalininskiy sovnarkhoz.  
(Kalinin Economic Region--Peat industry)

BARANOV, A.H., redaktor; LYSTUK, V.N., redaktor; SHUROV, S.I., redaktor;  
APRENCHENKO, V.S., redaktor; ITENBERG, I.M., redaktor; KURAKINA, V.I.  
redaktor; MOSTRAN, S.L., redaktor; SMIRNOVA, A.L., redaktor; TYURIN,  
S. A.; YAKOVLEVA, A.K.; GUREVICH, I.V., tekhnicheskiy redaktor.

[World atlas; index of geographical names] Atlas mira; ukazatel'  
geograficheskikh nazvaniy. Moskva, 1954. 571 p. (MLRA 8:9)

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye geodesii i kartografii.  
(Atlases)

ALAMPIYEV, P.M.; ~~APENCHENKO, I.S.~~; BEKOVA, T.N.; BYUSHGENS, L.M.; GINZBURG,  
G.Z.; GORDONOV, L.Sh.; GRIGOR'YEV, A.A., akademik; GURARI, Ye.L.;  
DANILOV, A.D.; IEMIN, L.A.; DOBROV, A.S.; SHIRMUNSKIY, M.M.;  
KULAGIN, G.D.; MILEYKOVSKIY, A.G.; MURZAYEV, E.M.; PAVLOV, V.V.;  
POPOV, K.M.; YANITSKIY, N.F.

Lev Iakovlevich Ziman, 1900-1956; obituary. Izv. AN SSSR. Ser. geog.  
no. 6:153-154 N-D '56. (MIRA 10:2)

(Ziman, Lev Iakovlevich, 1900-1956)

USSR/Cultivated Plants. Fodders.

M-4

Abs Jour : Ref Zhur - Biol., No 7, 1958, 29859

Author : Rudoy, B.Z., Stadnichuk, P.F., Vlasova, A.S., Mozzhukhina, S.V., Apenkina, A.A.

Inst : The Novocherkask Technical Zoological and Veterinary Institute.

Title : The Effect of Cultivation Conditions on the Chemical Composition of the Seeds and Cobs of Corn.

Orig Pub : Tr. Novocherkasskogo zootekhn.-vet. in-ta, 1957, vyp. 10, 125-132.

Abstract : A chemical analysis of corn cobs of various varieties has shown the high food value of not only the kernels but of the cobs themselves as well, containing up to 50% carbohydrates, 3.5% protein and ~ 1% fat. The joint application of compost and P<sub>c</sub> (20 t. per ha. + 1 centnor per ha.)

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USSR/Cultivated Plants - Fodders.

M-4

Abs Jour : Ref Zhur - Biol., No 7, 1958, 29859

on the Groznenskiy Krug variety with irrigation being used increased the cob yield by more than 22 centners per ha. On fertilized ground an increment in the number of plants per bunch from 2 to 3 increased the yield by 30%. Fertilization with  $P_2O_5$  increased the protein content by 2.5 centners per ha., the amount of P and K in the grains and decreased the content of cellulose.

Card 2/2

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AFANASI'YEV, Vladimir Aleksandrovich; APENKO, M.I., red.;  
KHROMCHENKO, F.I., red. izd-va; SUNGUROV, V.S., tekhn. red.

[Optical measurements] Opticheskie izmereniia. Moskva, Izd-  
vo geodez.lit-ry, 1961. 238 p. (MIRA 15:2)  
(Optical measurements)

URVAKHER, Leonid Samuilovich; ROMANOV, D.A., kand. tekhn. nauk, dots.,  
retsenzent; TSYGANOV, M.N., kand. tekhn. nauk, retsenzent;  
APERIKO, M.I., kand. tekhn. nauk, red.; SPAMAROVA, T.A., red. izd-  
va; SUNGUROV, V.S., tekhn. red.

[Optics of photographic and aerial photogrammetric instruments]  
Optika fotograficheskikh i aerofotogrammetricheskikh priborov.  
[n.p.] Izd-vo geodes. lit-ry, 1962. 215 p. (MIRA 15:12)  
(Photographic optics) (Aerial photogrammetry)